GLINBERG, M.G.

Difficulties in the differential diagnosis of tuberculosis and of lung cancer. Probl. tub. 36 no.8:42-44 '58. (MIRA 12:7)

1. Iz tuberkuleznogo otdeleniya (zav. K. L. Shvets, konsul'tant - kand. med. nauk I.I. Vil'derman) IV klinicheskoy bol'nitsy v Kishneve.
(LUNGS--CANCER) (TUBERCULOSIS)

GLINBERG, M.

S[illegible] clinical [illegible] 13-18 (MIRA [illegible])

[illegible]

GLINCHEVSKIY, V. N.

Screw cap for hydraulic pipe testing. Mashinostroitel' no.10:22 O '62. (MIRA 15:10)

(Pipe--Testing)

GLINCHEVSKIY, V.

Foreman V.P.Korabel'shchikov. Mashinostroitel' no.2:4 F '63.
(MIRA 16:3)

(Penza—Machinery industry)

GOROKHOV, I., inzh. (Zhdanov); GRANKOV, L., inzh. (Zhdanov); RAKHMANOV, N., inzh.-mayor, izobretatel'; BASKAKOV, Yu. (Chernogorsk); PERFIL'YEV, N. (Moskva); GLINCHEVSKIY, V. (Penza); KORNEV, M., inzh. (Kiyev); MIKHAREV, P., konstruktor (Orenburg"; D'YACHKOV, M. (Irkutsk)

How interesting! Izobr.i rats. no.1:19 '63. (MIRA 16:3)

1. Nachal'nik Penzenskogo byuro po delam ratsionalizatsii i izobretatel'stva (for Glinchevskiy).

(Technological innovations)

GLINCHEVSKIY, V.

Device for automatic restriction of the idling of welding transformers. Mashinostroenie no.6:104-105 N-D '62.
(MIRA 16:2)
(Electric transformers--Safety appliances)

GLINCHEVSKIY, V.N.

Plug for the hydraulic testing of pipes. Ratsionalizatsiia 13 no.2:26 '63.

GLINCHEVSKIY, V.N.

Equipment for automatic control of the switching-on time for the heating of industrial furnaces and baths. Mashinostroenie no.1:104 Ja-F '63. (MIRA 16:7)

(Automatic timers)

GLINCHEVSKIY, V.N.; IL'YANKOV, B.F.

Automatic limiter of the idle running of welding transformers. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. 16 no.10:28-30 '63. (MIRA 16:11)

GLINCHEVSKIY, V.N.

Blind flanges for the hydraulic testing of [illegible] [illegible]
neft. mashinostr. no.[illegible] [illegible] [illegible]

1. GLINCHUK, D.

2. USSR (600)

4. Coal Mines and Mining - Ukraine

7. In the lignite pits of the Ukraine, Mast.ugl. 2 no. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953. Uncl.

GLINCHUK, D. inzhener

One should value every second of a work schedule. Mast. ugl. 3 no.12:17-18 D '54. (MLRA 8:6)
(Coal mines and mining) (Excavation)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000515410003-2"

GLINCHUK, K.D.; MISELYUK, Ye.G.

Photoelectric method for measuring the length of diffusion displacement of secondary current carriers in semiconductors. Ukr. fiz.zhur. 1 no.1:44-58 '56. (MLRA 9:11)

1. Institut fiziki Akademii nauk URSR.
(Semiconductors) (Photoelectric measurements)

SUBJECT USSR / PHYSICS CARD 1 / 3 PA - 1814
AUTHOR GLINČUK,K.D., KISELJUK,E.G., RASBA, E.I.
TITLE The Measuring of the Recombination Velocity of Carriers by Conductivity Modulation.
PERIODICAL Žurn.techn.fis, 26, fasc.12, 2607-2613 (1956)
Issued: 1 / 1957

Though the photoelectric method of measuring the life τ of non-basic carriers is today mostly used, it has considerable disadvantages, as e.g.: difficulties when measuring too short diffusion lengths L; the method is applicable only if the local concentration of carriers changes only little; insufficient accuracy; not practicable when measuring τ in the hole-material. A much more serviceable method of measuring τ is that by conductivity modulation on the occasion of the illumination of the sample. Unlike the first method, life is here determined by one single measurement. The geometric criteria are considerably more simple and the method may also be applied for the hole material At first the theory of the method is dealt with. A homogeneous semiconductor sample of cylindrical form is investigated. Formulae for the modulation of the conductivity of the semiconductor on the occasion of illumination and in consideration of surface- and volume recombination are derived. If the volume life τ is short and if the velocity of surface recombination is not too high, so that $\frac{sL}{\delta} \ll 1$, then $\tau_{eff} = \tau$, and it is possible by this method to measure τ_p (s is the velocity of surface recombination, δ is the diffusion coefficient, p - hole concentration). If it is true that $\frac{sL}{\delta} \gtrsim 1$, it is possible to find τ_p, if s is known. Inversely, if τ_p is known it is

Žurn.techn.fis, 26, fasc.12, 2607-2613 (1956) CARD 2 / 3 PA - 1814

possible to determine s. Such measurements can be carried out for extremely high values of s $\sim 10^4 - 10^5$ cm/sec. Next, the measuring method is discussed. In order to measure $\tau_{eff} = \frac{\delta P}{N}$ it is necessary to measure a number of electrode-hole N-pairs which are formed by light in the sample within one second as well as the modification δR of the resistance offered by the sample occurring at that time (δP is the full number of photo holes in the sample, N is the capacity of the photo-hole source in holes per second). The scheme of the measuring system is shown. Before measuring was begun, it was found in the case of all samples that the volume photoelectromotoric force was lacking, the light probe was calibrated by measuring the short circuit photocurrent and a light source with a colored temperature of 2360° C was used. In conclusion measuring results are described. In the case of a similar treatment of the surface, s depends on the specific resistance ϱ of the germanium. Therefore the maximum L_p are determined by the ϱ values. The minimum τ_p are determined by the intensity of the light probe, by the specific resistance of the material, and by the minimum modification of voltage. Measurements of τ_{eff} in dependence of the current used for the sample are shown in form of a curve, τ_p was at first determined by the method of conductivity modulation on a surface warranting a small s. Hereafter, the surface was roughly ground and etched. On the occasion of this treatment

s was determined according to the formula $s = \frac{\tau_p - \tau_{eff}}{\tau_{eff}} \quad \frac{\delta}{L_p}$ and compared with the result obtained by means of the photoelectric method. Values of from $\sim$ 600 ÷ 2500 cm/sec were obtained for s. The same method was applied on other surfaces, on which occasion values of from 10 000 to 30 000 cm/sec were obtained for s.

INSTITUTION: Physical Institute of the Academy of Science of the Ukrainian SSR, Kiev.

GLINCHUK, K.D. [Hlynchuk, K.D.]; IVANOVA, G.X.; MISELYUK, Ye.G. [Misєliuk, O.H.].

Effect of minority current carrier lifetime on germanium point triodes [with summary in English]. Ukr. fiz. zhur. 2 no.4:338-346 '57. (MIRA 11:3)

1. Institut fiziki AN URSR.

(Triodes)

57-11-4/33

AUTHORS: Glinchuk, K. D., Miselyuk, Ye. G., Fortunatova, N. N.

TITLE: Investigation of Recombination of Current Carriers in Germanium with the Admixture of Iron (Issledovaniye rekombinatsii nositeley toka v germanii s primes'yu zheleza).

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 11, pp. 2451-2457 (USSR).

ABSTRACT: The influence of the glowing on the states of the two acceptor levels (see W. E. Tyler and H. H. Woodbury, Phys. Rev., 96, 874, 1954) and the recombination lifetime of the carriers in n-germanium with iron admixture were investigated as well as the capture cross section of the non-equilibrium current carriers in these levels. It is shown that an acceptor level occuring in such a germanium which lies at 0,27 eV of the conductivity zone is eliminated by glowing at t= 450 ÷ 500°C. This becomes obvious in the first great increase of the life-time of the non-equilibrium current carriers. It is assumed that the observed glow effect is due to the deactivation of the iron atoms in consequence of the elimination of the latter from the germanium lattice. The capture cross section for holes in the mentioned local level is determined and the value $S \approx 1.10^{-14}$ cm² obtained. There are 1 table, 2 figures, 5 Slavic references.

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Investigation of Recombination of Current Carriers in Germanium with the Admixture of Iron. 57-11-4/33

ASSOCIATION. Institute for Physics of the AN of the Ukrainian SSR., Kiyev (Institut fiziki AN USSR.,Kiyev).

SUBMITTED. April 23, 1957.

AVAILABLE. Library of Congress.

Card 2/2

Glinchuk, K.D.

AUTHORS: Glinchuk, K.D., Miselyuk, Ye.G., Fortunatova, N.N. 57-11-31/33

TITLE: Influence of Annealing on Local Levels and the Life time of Non-equilibrium Current Carriers in Germanium with Iron as Impurity. (Vliyaniye otzhiga na lokal'nyye urovni i vremya zhizni neravnovesnykh nositeley toka v germanii s primes'yu zheleza.) Letter to the Editor)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 11, pp. 2606-2607 (USSR)

ABSTRACT: W.W.Tyler and H.H.Wood-Bury showed that the insertion of iron into germanium leads to the development of two acceptor-levels with great ionisation-energy in the energy structure of the germanium. The existence of these levels highly reduces the recombination-life of the current-carriers in the germanium. Were the influence of the annealing on the condition of these levels and on the recombination -life of the non-real carriers τ in the germanium with an addition of iron was investigated. Also the capture cross-sections of the non -real current-carriers were determined. It is shown that during the annealing a de-activation of the admixture-level with an activation energy of 0,2o e.V. took place. Consequently the current-carrier concentration within the area of the admixture conductivity increased at the expense of a supplement of carriers, which before the annealing were situated at the levels developed from iron. Besides, as a consequence of the annealing the recombination time τ rose from 2 sec. before the annealing to 60 sec. after the annealing. In some cases even up to a hundred times and more. For the trap cross-

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Influence of Annealing on Local Levels and the Life Time of Non- 57-11-31/35
equilibrium Current Carriers in Germanium with Irons as Impurity.

sections of the holes at the acceptor-levels of 0,27 eV of the conductivity area bottom and of 0,34 eV of the valent zone the values $S_p \approx 1,o.1o^{-14}$ qcm and $S_p \approx 5,o \times 1o^{-15}$ qcm respectively were found according to W.Shockley and W.Read.
There are 1 figure and 2 Slavic references.

ASSOCIATION: Institute for Physics of the AN of the Ukrainian SSR, Kiyev (Institut fiziki AN USSR, Kiyev)

SUBMITTED: January 26, 1957

AVAILABLE: Library of Congress

Card 2/2

[illegible]-17/57

AUTHORS: [illegible] D., [illegible], [illegible] G., [illegible] A. I.

TITLE: [illegible] Small [illegible] of [illegible] [illegible] (T[illegible] [illegible] [illegible] [illegible])

PERIODICAL: [illegible]

ABSTRACT: [illegible] [illegible]. [illegible] of [illegible] [illegible] [illegible] results of [illegible] [illegible] [illegible]-contact [illegible] [illegible] saturation [illegible]. A [illegible] are given which illustrate [illegible] [illegible] [illegible]. It is [illegible]

$$[illegible] = \tau \ln (i_{[illegible]}/i_{[illegible]})$$

[illegible] is the delay time [illegible] current, $i_{[illegible]}$ [illegible] current, i_{crit} is the critical [illegible]

Card 1/3 [illegible] corresponds to the [illegible]

[illegible] Lif[illegible] of No[illegible] [illegible] Cu[illegible] in Germaniu[illegible].

[illegible] equilib[illegible] current carriers [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] of conductivity [illegible] [illegible] lifeti[illegible] with [illegible] [illegible] in Fi[illegible]. E. I. [illegible] and [illegible] [illegible]ka[illegible]a [illegible] for their help. There are 5 fi[illegible] [illegible]

Card 2/[illegible]

[illegible]

[illegible] -Equi[illegible] [illegible]

[illegible]

[illegible] fiziki AN SSSR ([illegible] of the USSR)

[illegible]

Card 3/? [illegible] ermanium--Electrical properties [illegible] --Applicati[illegible]

BELYAYEV, A.D. [Bieliaiev, A.D.]; GLINCHUK, K.D. [Hlynchuk, K.D.]; MISELYUK, Ye.G. [Miseliuk, O.H.]

Investigation of the recombination of current carriers in germanium with some impurities. Part 1: Germanium, pure and with Sb or Ga impurities. Ukr.fiz.zhur. 3 no.5:624-631 S-O '58. (MIRA 12:2)

1. Institut fiziki AN USSR.
(Germanium--Electric properties)

AUTHORS: Glinchuk, K. D., Miselyuk, Ye. G., 57-28-5-24/36
Fortunatova, N. N.

TITLE: Influence of Annealing on the Local Levels and the Life of Current Carriers Not in Equilibrium in p-Type Germanium With Iron Impurities (Vliyaniye otzhiga na lokal'nyye urovni i vremya zhizni neravnovesnykh nositeley toka v germanii p-tipa s primes'yu zheleza)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 5, pp. 1053-1053 (USSR)

ABSTRACT: In the previous paper (Ref 1) the recombination of the current carriers in p-type germanium with iron impurities was investigated. In this letter to the editor the authors communicate the results of similar investigations. A figure shows the curves representing the temperature dependence of the Kholl (Hall) constant ln R = f(1/T) for one of the samples of p-type germanium. As can be seen from the figure, the level is situated at 0,33 eV from the valence zone. It can also be seen that this level is removed by the annealing. This becomes manifest by the modification of the kind and the magnitude of conductivity as well as in a marked increase of the life τ in the sample. This modification of the kind and the magnitude of conductivity due to annealing is ex-

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plained by the fact that the electrons, which previous to the annealing partly fill up the local level 0,33eV (at $T \simeq 0^{0}K$), passed into the conduction zone after annealing. The increase of τ is also explained by the dislocation of the level during annealing. As a conclusion it may be mentioned that values of $\tau_e = 1 \div 20$ microseconds at $\varrho = 1 \div 50$ ohm cm were observed in monocrystalline germanium samples of the p-type with iron impurities. The minimum τ_e which could be observed in such a germanium, had the value ≈ 0.15 microseconds at $\varrho = 4$ Ohm.cm. The authors express their gratitude to V.Ye. Lashkarev, Member, AS, UkrSSR and K.B. Tolpygo for suggestions. There are 1 figure and 1 Soviet reference.

ASSOCIATION: Institut fiziki AN USSR, Kiyev (Kiyev Physics Institute, AS UkrSSR)

SUBMITTED: July 4, 1958

1. Germanium crystals - Properties

67385

24.770

~~24(6)~~

SOV/181-1-9-3/31

AUTHORS: Glinchuk, K. D., Miselyuk, Ye. G., Fortunatova, N. N.

TITLE: Investigation of the State of Local Silver and Gold Levels in Germanium

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 9, pp 1345 - 1350 (USSR)

ABSTRACT: The present paper investigates the influence exerted by medium-temperature annealing ($T = 400 - 600^{\circ}C$) on the state of local gold and silver levels in germanium. As already shown by other authors (Refs 1-8), Cu, Fe, Co, and Ni in germanium can be deactivated by medium-temperature annealing, i.e. these impurities pass over from an "active" to a "passive" state. The aim of the present paper was to investigate this phenomenon more closely. Also the temperature dependence of the minority carrier concentration and of the lifetime of the minority carriers τ was measured. The method of preparing the samples and of conducting the investigation is described in references 2 and 15 The paper consists of two parts: the first deals with the influence of annealing on the state of the acceptor levels of silver in germanium, and the second on those of gold in germanium. Figure 1 shows the temperature

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Investigation of the State of Local Silver and Gold Levels in Germanium SOV/181-1-9-3/31

dependence of the carrier concentration for two p-type germanium samples prior to (curves 1,2) and after (curves 1', 2') the annealing process (500°C, 24 h). The curves exhibit a certain T-independent range, for which the Ag-impurity concentration can be calculated. The following was obtained for the two samples:
N = 3.6.10^{13}cm^{-3}(1) and 1.6.10^{13}cm^{-3}(2). Figure 2 illustrates the influence of annealing on τ. It is found in general that τ is considerably reduced by the introduction of silver. Curves 1 and 1' show the behavior of sample (2). An interesting phenomenon is that the plateau existing before annealing vanishes after that process. A maximum appears in its place, i.e. there is a recombination level with the activation energy E_t = 0.07 ev. The course of the function τ (T) before annealing is, as briefly shown, explainable by the theory of recombination on multicharge centers. Figure 3 shows the temperature dependence of the carrier concentration for two gold-doped germanium samples: before annealing (full circles) and after annealing (empty circles). Annealing took place at

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Investigation of the State of Local Silver and Gold Levels in Germanium SOV/181-1-9-3/31

500° during 48 hours, and the course of the curves was found to be practically independent of the annealing process. Nor did an annealing carried out at 600° during 72 hours effect any change therein. Curve 2 shows τ (T) for p-type germanium (ρ = 20 ohm/cm) again before and after annealing. Here again, no influence of annealing was noticed. Finally, the authors thank V. Ye. Lashkarev, Academician of the AS UkrSSR for his advice, A. N. Kvasnitskaya for preparing the samples, and N. M. Tkach for his aid in the measurements. There are 5 figures and 21 references, 7 of which are Soviet.

ASSOCIATION: Institut fiziki AN USSR Kiyev (Physics Institute of the AS UkrSSR, Kiyev)

SUBMITTED: January 9, 1959

Card 3/3

GLINCHUK, K.D. [Hlynchuk, K.D.]; MISELYUK, Ye.G. [Miseliuk, O.H.]; FORTUNATOVA, N.N. [Fortunatova, N.M.]

Recombination of charge carriers in germanium doped with some impurities. Ukr. fiz. zhur. 4 no.2:207-218 Mr-Ap '59. (MIRA 13:1)

1. Institut fiziki AN USSR.
(Germanium)

S/185/61/006/001/004/011
D210/D305

18 3100

AUTHOR: ~~Hlinchuk~~, K.D. and Tkach, N.M.

TITLE: Extraction of Ni, Ag, Fe impurities from germanium

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, no. 1961, 49-55

TEXT: This paper describes research on the extraction of nickel, silver and iron impurities from germanium by coating its surface with Au, Sb, Sn and Ag during a sequence of heat treatments. It was proved that copper could be extracted from germanium by high temperature treatment in contact with the following metals: Sn, Pb, Au, Sb, As, Fe, Ag, In, Zn, Ga, Ta, Ni, Bi and also in contact with some cyanide solutions. The extracting ability of various coatings can be explained by the value of the coefficient of absorption. This coefficient for copper alloyed with germanium is considerably smaller than 1 (10^{-5} - 10^{-}). Effectiveness of the copper extraction is also increased by the high velocity of its diffusion. Thanks to it, copper in a comparatively short time moves to the surface of germ-

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anium. It can be concluded that the effect of extraction [illegible] can be sufficiently big for impurities which have similar properties to copper i.e. a comparatively low solubility in germanium in comparison with the solubility in extracting metals and also a high velocity of diffusion. With regard to the above, there is a possibility of extracting from germanium the following impurities: Ni, Ag, and Fe which all have a low solubility in germanium and a high velocity of diffusion. The following metals were chosen as coatings: Au, Sn and Sb. These metals have a low velocity of diffusion in comparison with Ni, Ag and Fe; this prevents the possibility of their diffusion into germanium during the process of extraction. The samples for extracting impurities have been prepared from ordinary germanium. The impurities have been introduced into germanium by the melting process (Fe); and by diffusion at [illegible] (Ni) and at 850°C (Ag) in Argon. The extractions were carried out at the same temperatures. Concentrations of Ni, Ag and Fe as well as the changes in their amounts during the extraction process were established by the temperature dependence of Hall's coefficient and by the temperature dependence of the half life. Germanium was coated with different

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metals, of a thickness of a few [illegible] in vacuum [illegible] electrically (Sn, Ni) or by the residue from 0.5 [illegible] aqueous [illegible] nitrate (Ag). The results are shown graphically and in tabular form. It can be seen that the metallic coatings applied are effective in extracting Fe, Ni and Ag impurities from germanium [illegible] by the complete re-establishment of [illegible] by the considerable increase of τ and the diminishing of concentration of atoms [illegible] set by the radioactive analysis. The results also [illegible] coating extracts Ni impurities from germanium [illegible] that the re-establishment of [illegible] is considerably smaller than when [illegible] and Pb coatings are used, which can be explained by the penetration of silver atoms into germanium during the process [illegible] They also show that heat treatment in the presence of [illegible] coating causes the extraction of Ni and Ag atoms from germanium [illegible] Finally, it can be seen that Au, [illegible] Sn, Ag and [illegible] effectively extract copper from germanium. In effect the application of metallic coatings (Au, [illegible] Sn) causes the complete transfer of impurities of [illegible] into the above mentioned metals. The observed increase of concentration of light ionizable atoms of [illegible]$^{-10}$ and [illegible] 10^{15} [illegible] 10^{15}

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18 [illegible] 006/001/[illegible]/011
210 [illegible]

Extraction of Ni [illegible] e Impurities

cm^{-3}; after the process of extraction [illegible] not fully restored value of τ are probably caused by [illegible] in the crystal lattice which occur during the [illegible] of germanium. There are 1 table, [illegible] figures and [illegible] references [illegible] and 12 non-Soviet-bloc. The references to the English-language publications read as follows: [illegible] 1959; [illegible] Appl. Phys. 30 [illegible]

ASSOCIATION: Institut fiziki [illegible]

SUBMITTED: March 31, 1960

Card 4/4

GLINCHUK, K. D., Cand Phys-Math Sci, "Investigation of recombination processes in Germany, using certain multiple charge admixtures." Kiev, 1961. (Acad Sci UkSSR, Inst of Semiconductors). (KL, 3-61, 203).

38

AUTHORS: [illegible], and [illegible]

TITLE: [illegible]

PERIODICAL: [illegible] zhurnal, [illegible]
[illegible] - 150

TEXT: [illegible] between the [illegible] of [illegible]-
gation and the diffusion coefficient of impurity atoms of Fe, Co,
Ni and Ag in germanium at various annealing temperatures ([illegible] -
°C). The investigations included measurements of the lifetime of
minority carriers in n- and p-type germanium specimens in which the
concentration of readily ionized Sb- and Ga impurities exceeded con-
siderably the concentration of Fe, Co, Ni and Ag impurity-atoms.
In such specimens, τ varies in inverse proportion with the change
in concentration of these impurities. The [illegible]
the method of measurement were described in the [illegible]. The ex-
periments showed that an increase in annealing temperature leads to

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Kinetics of segregation of [illegible], ... [illegible]

[illegible]; [illegible] [illegible] ing annealing time. [illegible] of τ for germanium with Co-impurity before and after annealing; τ [illegible] increased by a factor of 1.5 through annealing, in the course of low temperature [illegible] annealing [illegible]. The experiments [illegible] that the saturation of τ is [illegible], in which structural defects [illegible] recombination centers. Analogous results were obtained for [illegible] specimens with Fe, Co, Ni and Ag impurities. The rates of segregation of Fe, Co, Ni and Ag impurities were [illegible] - 600°C. It was found that at [illegible] Fe, Co and Ag were practically [illegible], whereas the segregation rate of Ni was considerably higher. [illegible] explained by the [illegible] (with [illegible]) of the diffusion coefficients of the impurities, [illegible] Fe, Co, Ni and Ag atoms. Thus, the conjecture [illegible] that the segregation rate of impurities is mainly determined by their rate of diffusion to the nucleation centers, was confirmed.

Card [illegible]

SUBMITTED: March 23, 19[illegible]

Card 3/3

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[illegible]

experimental results with the theory of [illegible]

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[illegible]

Study of [illegible] recombination [illegible] ...

charge centers, [illegible] in [illegible]-type specimens [illegible] di-
[illegible] takes place [illegible] atoms, whereas in n-type specimens -- [illegible] addition, the capture cross-section was [illegible] of [illegible] neutral and single-charged [illegible] and [illegible] and Au atoms. The injection of [illegible], Co, Ni, [illegible] and Au impurities [illegible] germanium, leads to the formation of a system of deep [illegible] levels, related to the various charged states of [illegible] only some of these levels play a predominant role in the recombination of carriers. In n-type germanium, the recombination [illegible] ce through the same charged states of atoms of Fe, Co, Ni, [illegible] Au impurities; therefore the temperature- and concentration dependence of [illegible] in such [illegible] similar [illegible] for all [illegible] rities. In p-type germanium, however, [illegible] through different charged states of [illegible] and Ni, Ag and Au atoms -- on the other. [illegible] the temperature and concentration dependence [illegible], differs sharply in both these groups of impurities. The [illegible] Co, Ni, Ag and Au atoms in n-type germanium and [illegible]

Card 2/3

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000515410003-2"

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24.4177

S/185/62/007/004/009/018
D407/D301

[illegible]: Hlynchuk, K. D., Lytovch[illegible], M. M., and [illegible]yuk, O. S.

[illegible]: [illegible] the rate of [illegible] recombination in [illegible]manium by modulation of impurity photo-conductivity

[illegible]: [illegible] zhurnal, v. 7, no. 4, 1962, [illegible]

TEXT: A method is described for measuring the lifetime τ of majority carriers in germanium. It is shown that this method can be used for determining, at various temperatures, the capture cross-sections of majority carriers by the levels of the many-charge Au and Ni impurities in Ge. The method is based on the stationary-photoconductivity method (described by the authors in an earlier work). First, a theoretical energy-band model is proposed. Formulas are derived which relate the change in

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[illegible] the [illegible] of...

S/[illegible]/[illegible]/[illegible]/0.9/0[illegible]
D[illegible]/D[illegible]

[illegible], a [illegible] characteristic [illegible] of the impurity [illegible], and the lifetime τ. Further, the experimental procedure, and the [illegible] are described. The light source [illegible] (λ = 3 to 10 μ) was a [illegible] black body. [illegible] by appropriate choice of the filters, it was possible to single out the wavelengths, for which the absorption coefficient of light by the Au and Ni impurities varied little. Thereupon, the total number $\mathfrak{N}$ of non-equilibrium carriers was determined, created each second by the light. The specimen under investigation was placed in a cryostat with a germanium window. The change in specimen resistance, on illumination, was determined by measuring its voltage δU. The lifetime was determined by the working formula

$$\tau = \frac{\delta U}{U} \cdot \frac{(R_H + r)^2}{R_H r} \cdot \frac{p_0}{k \mathfrak{N}_0} \cdot \frac{lb}{l'b'} , \qquad (12)$$

Card 2/4

where R_L is a variable resistance, r is the [illegible], p is the [illegible] concentration, $k = \sigma N_0$ ([illegible] being the capture [illegible] of [illegible] by impurity centers whose concentration is N_0), 'S' is the illuminated area. The values of τ, measured at a temperature $T = 82^{\circ}K$ on p-type germanium specimens with Au and Ni impurities, are listed in a table. The impurity concentration was of the order of $10^{15} cm^{-3}$. Four specimens (no. 1 - 4) had partially compensated E_i-levels at $T = 0^{\circ}K$, as a result of which their resistivity was of the order of $10^4 - 10^5$ ohm · cm (at low temperatures). In specimens no. 5 - 7, the E_i-levels were completely free at $T = 0^{\circ}K$, as a result of which their resistivity was low (3 - 10 ohm · cm). The capture cross-section for holes by negatively charged Au and Ni atoms, calculated for specimens no. 1 - 4, were in agreement with the results of other investigators. In the specimens no. 5 - 7,

Card 3/4

[illegible] ... S/1[illegible]/[illegible]/[illegible]
[illegible]

the lifetime τ had much larger values than expected. This might be due to the fact that the authors neglected additional [illegible] related to light absorption by other [illegible]-centers. There are [illegible] figures, 1 table and 20 references: 11 Soviet-bloc and 9 non-Soviet-bloc (including [illegible] translations). The 4 most recent references to the English-language publications read as follows: L. Johnson, H. Levinstein, Phys. Rev., 117, [illegible], 1960; T. Vogl, J. Hansen, M. Garbuny, J. Opt. Soc., 51, 70, 1961; E. [illegible], W. Bernard, Phys. Rev. Letters, 6, [illegible], 1961; F. Klaasen, J. Blok, H. Booy, Physica, 27, 4[illegible], 1961.

ASSOCIATION: Instytut napivprovidnykiv AN UkrSR (Institute of Semi-conductors of the AS UkrSSR), Kyyiv

SUBMITTED: October [illegible], 1961

Card 4/4

44183

S/181/62/004/012/047/052
B125/B102

AUTHORS: Glinchuk, K. D., and Miselyuk, Ye. G.

TITLE: The cross section of the electron capture by negatively charged atoms of deep impurity levels in germanium

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3671-3673

TEXT: The cross section S_{2e} of the electron capture by negatively charged atoms is determined by investigating the photoconductivity of n-type germanium with a Ni impurity (concentration $N \sim 10^{15}$ atoms/cm^3) due to phototransition of electrons from dual charged atoms (with an N_2 concentration) into the conduction band. The values and the temperature dependence of the cross section S_{2e} cannot be determined exactly from intrinsic photoconductivity since the carrier recombination is linear only for injection levels which are difficult to attain (S. G. Kalashnikov. Trudy Mezhdunarodnoy konferentsii po poluprovodnikam (Papers of the International Conference on Semiconductors), p. 241, Prague, 1961; K. D. Glinchuk et al., Ukr. Fiz. zh., 7, 152, 1962). The main measurements, made on samples with

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The cross section of the... S/181/62/004/012/047/052
B125/B102

$n_c' = N_d - 2N \sim 10^{13}$ to 10^{14} cm, were supplemented by others on samples of high resistivity partly compensated, for which $N < N_d < 2N$, where N_d is the concentration of an easily ionizable donor impurity. From these measurements the range $\delta n \ll n_0 (N/N_2) + N - N_2$ of the non-equilibrium carrier concentration with linear recombination has been considerably enlarged and the influence of the adhesion centers of the minority carriers has been eliminated. The lifetime $\tau = 1/vS_{2e}(n_0(N/N_2)+N-N_2)$ was determined from the damping and stationary values of impurity photoconduction.
$n = N_d-2N_2-N_1=N_d-N-N_2$ is the electron concentration in the conduction band. $N_2=n_c'-n_0+N$ and $N=N_1+N_2$ have to be found from measurements of the Hall coefficient. The function $\tau=f(1/T)$ for low resistance Ni-doped n-type germanium consists of a region of a weak ($\leqslant 120°K$) and of a strong ($> 120°K$) temperature dependence. The weak temperature dependence of τ is determined solely by the change of S_{2e} (n_0 = constant, $N \sim N_2$), the strong temperature dependence also by the increase of n_0 and $N \sim N_2$. The following expression

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is valid for both temperature ranges: $S_{2e} \sim e^{-\Delta\varepsilon_{1,2}/kT}$, where $\Delta\varepsilon_1 \sim 0.02$ ev at T=80-100°K and $\Delta\varepsilon_2 \sim 0.1$ to 0.15 ev at T > 150°K. The latter agree well with the values for p-type germanium. The temperature dependence of S_{2e} for n-type germanium with Ag and Au impurities is similar but not as distinct as with Ni impurities. The changes of the temperature dependence of S_{2e} point to the existence of at least two different mechanisms for electron recombination at single charged atoms of the deep impurity centers in germanium. The absolute values of S_{2e} are determined by the depth of the levels produced by multi-charged impurities and by the Coulomb repulsion at the recombination center. There are 2 figures.

ASSOCIATION: Institut poluprovodnikov AN USSR, Kiyev (Institute of Semiconductors AS UkrSSR, Kiyev

SUBMITTED: August 3, 1962

GLINCHUK, K.D. [Hlynchuk, K.D.]; LITOVCHENKO, N.M. [Lytovchenko, N.M.]; MISELYUK, Ye.G. [Miseliuk, O.H.]

Measurement of the recombination rate of charge carriers in germanium by modulating the photoconductivity of the impurity Ukr.fiz.zhur. 7 no.4:387-395 Ap '62. (MIRA 15:8)

1. Institut poluprovodnikov AN UkrSSR, g. Kiyev.
(Germanium--Electric properties)
(Energy-band theory of solids)
(Photoconductivity)

GLINCHUK, K.D. [Hlynchuk, K.D.]; MISELYUK, ..G.[Miseliuk, O.H.]

Studying the recombination of charge carriers in n-germanium doped with multiply charged impurities, taking the impurity photoconductivity as a basis. Ukr. fiz. zhur. 7 no.9:992-1002 S '62. (MIRA 15:12)

1. Institut polyprovodnikov AN UkrSSR, Kiyev.
(Germanium) (Quantum theory) (Photoconductivity)

S/185/62/007/011/018/019
D234/D308

GLINCHUK

AUTHOR: ~~Hlynchuk,~~ K.D.

TITLE: Measurement of diffusion length of current carriers in Ge and Si by means of photoconductivity modulation

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 11, 1962, 1255-1257

TEXT: If $kL \gg 1$ (k being the light absorption coefficient) the average lifetime τ of carriers can be calculated from

$$\tau = \tau_0 \frac{\mathrm{ch}\frac{d}{L} + \frac{D}{sL}\,\mathrm{sh}\frac{d}{L} - 1}{2\mathrm{ch}\frac{d}{L} + \left(\frac{D}{sL} + \frac{sL}{D}\right)\mathrm{sh}\frac{d}{L}} \qquad (1)$$

Measuring τ in specimens with different thickness d, the diffusion length L can be found from the best coincidence of experimental and

Card 1/2

Measurement of diffusion ... S/185/62/007/011/018/019
D234/D308

theoretical curves. If $sL/D \gg 1$, τ is inversely proportional to s for all values of d. Then, measuring τ in a specimen with $d_1 \gg L$ and in one with $d_2 \ll L$, one can determine L from

$$L = \frac{\tau_{d_1}}{\tau_{d_2}} \cdot \frac{d_2}{2} \qquad (3)$$

If measurement is impossible in the second specimen, L can be found from measurements with another specimen having the same surface finish, size and type of conductivity, but much larger L. The usefulness of these methods was confirmed by experiments on Ge and Si. If the effective surface recombination rate cannot be introduced, or if the carriers are trapped, the method is not applicable. There is 1 figure.

ASSOCIATION: Instytut napivprovidnykiv AN URSR, Kyyiv (Institute of Semiconductors AS UkrSSR, Kiev)

SUBMITTED: July 26, 1962

Card 2/2

S/181/63/005/002/005/051
B104/B186

24.4400

AUTHORS: Glinchuk, K. D., and Deygen, M. F.

TITLE: Theory of local electron centers near a semiconductor surface

PERIODICAL: Fizika tverdogo tela, v. 5, no. 2, 1963, 405 - 416

TEXT: The Schrödinger equation $(\hat{H} + V)\psi = E\psi$ is solved using methods due to C. Kittel and A. Mitchell (Phys. Rev., 96, 1488, 1954) and to J. Luttinger and W. Kohn (Phys. Rev., 97, 869, 1955). The behavior of a localized electron characterized by an effective volume mass is studied in adiabatic approximation. $\hat{H}$ is the Hamiltonian of the subsystem and can be written in the form $\hat{H} = T_E + V_i + V_p + V_e$, where T_E is the operator of the kinetic energy of the electron, V_i the energy of the interaction of an electron with a hole, V_p the energy of the interaction of an electron with the inert part of the polarization of the dielectric, and V_e the energy of interaction of an electron with its image. V is the electron energy potential in the field produced by holes and by polarization of the crystal; it is assumed

Card 1/3

Theory of local electron centers... S/181/63/005/002/005/051
B104/B186

that V varies little within a distance having the same order as the lattice constants. The wave function and the ground state energy of an electron at a localized center near the surface of the crystal are calculated. The thermal dissociation and photodissociation energies of an electron at a localized electron center are calculated as functions of the distance of the electron center from the surface of the crystal (Fig. 3). It is furthermore shown that the work function is proportional to the surface concentration of the localized electron centers, and inversely proportional to the effective electron mass. Maximum shift of the g-factor is achieved when the magnetic field is parallel to the surface. There are 4 figures and 1 table.

ASSOCIATION: Institut poluprovodnikov AN USSR, Kiyev (Institute of Semiconductors AS UkrSSR, Kiyev)

SUBMITTED: August 6, 1962

Card 2/3

S/181/63/005/003/035/046
B102/B180

AUTHORS: Glinchuk, K. D., Litovchenko, N. M., and Miselyuk, Ye. G.

TITLE: Trapping and adhesion of electrons on positive tellurium ions in germanium

PERIODICAL: Fizika tverdogo tela, v. 5, no. 3, 1963, 942-944

TEXT: Te has two donor levels in Ge, 0.11 and 0.3 ev below the bottom of the c-band. Electron trapping and adhesion was investigated for Te^0, Te^+, and Te^{++} impurities in n- and p-type germanium by measuring both the attenuation and the stationary intrinsic photoconductivity. The hole trapping cross section, S_h^+, was calculated and for both carrier types, τ, the lifetimes in the free state, were determined as a function of temperature. The S_h^+ estimate yields $3\cdot10^{-19}cm^2$ at $130^{\circ}K$; this is only weakly dependent on temperature in the range $90-130^{\circ}K$. There are 2 figures.

Card 1/3

Trapping and adhesion of electrons on ... S/181/63/005/003/035/046
B102/B180

ASSOCIATION: Institut poluprovodnikov AN USSR, Kiyev (Institute of Semiconductors AS UkrSSR, Kiyev)

SUBMITTED: October 19, 1962

Fig. 1. Model for the Te atom in Ge; $S_{*} \equiv S_e$, $S_{*} \equiv S_h$; E_F-Fermi level.

Fig. 2. $\tau(1/T)$ for p-type (1) and n-type (2) Ge with Te impurities; Small diagram: The same for Ge with acceptor ions.

Card 2/3

L 15551-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3003892 S/0181/63/005/007/1933/1935

AUTHOR: Glinchuk, K. D.; Denisova, A. D.; Litovchenko, N. M. 57

TITLE: Recombination of current carriers at zinc atoms in p-type silicon 56

SOURCE: Fizika tverdogo tela, v. 5, no. 7, 1963, 1933-1935 27

TOPIC TAGS: recombination, current carrier, Zn, Si, p-type, electron, hole, capture cross section, acceptor level, atom, lifetime, specific resistance, excess conductivity, zinc, silicon

ABSTRACT: The authors have determined the capture cross section of electrons by neutral atoms to be 10^{-15} cm^2 and of holes by singly negatively charged atoms to be 10^{-13} cm^2. This cross section is practically independent of temperature within the range 80-200K. It is noted that neutral and singly negatively charged atoms of zinc, because of the relative large values of capture cross section for both electrons and holes, can not bring about strong capture and trapping of electrons in p-type silicon, leading to the appearance of long-lived components in the relaxation of excess conductivity. Such atoms are effective recombination

Card 1/2

L 15551-63

ACCESSION NR: AP3003892

centers, the injection of which permits a considerable decrease in lifetime of current carriers. Orig. art. has: 1 figure.

ASSOCIATION: Institut poluprovodnikov AN UkrSSR, Kiev (Institute of Semiconductors Academy of Sciences, Ukrainian SSR)

SUBMITTED: 21Jan63 DATE ACQ: 15Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 011 OTHER: 003

Card 2/2

GLINCHUK, K.D., LITOVCHENKO, N.M.

Current carrier recombination on zinc atoms in n-type silicon. Fiz. tverd. tela 5 no.10:3003-3005 O '63. (MIRA 16:11)

1. Institut poluprovodnikov AN Ukr SSR, Kiyev.

GLINCHUK, K.D.; LITOVCHENKO, N.M.

Capture of current carriers in thermally treated silicon. Fiz. tver. tela 5 no.11:3150-3155 N '63. (MIRA 16:12)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

ACCESSION NR: AP3000236 S/0185/63/008/005/0575/0582

AUTHOR: Gly*nchuk, K. D. (Glinchuk, K. D.); Ly*tovchenko, N. M. (Litovchenko, N. M.)

TITLE: Investigation of recombination of current carriers in germanium with impurities of some elements. IV. Germanium with Te impurity

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 5, 1963, 575-582

TOPIC TAGS: recombination of charge carriers, Ge semiconductors, Te impurity, negative temperature

ABSTRACT: The recombination, capture, and attachment of charge carriers in n- and p-type Ge doped with Te at various temperatures have been investigated. It was determined that the cross section S sub p for hole-capture by positively charged Te atoms is of the order of 3 x 10 sup -19 cm sup 2 at 130K and depends but little on temperature in the range from 90 to 130K. A similar weak temperature dependence at low temperatures and approximately the

ACCESSION NR: AP3000236

same small values for S sub p were observed during recombination of electrons on negatively charged atoms of multicharge acceptor impurities. On the basis of these data it was concluded that the recombination mechanisms of holes and electrons on repulsive centers are identical. The difference in cross sections S sub n and S sub p may lead to a state in which the filling of the levels E sub 1 and E sub 2(1 - f sub i) with holes will surpass the filling of the levels of valence zone (1 - f sub v) with holes, i. e., will result in negative temperature. "The authors express their thanks to Academician of the AN URSR V. E. Lashkar'ov for his profitable discussions, to director of the laboratory O. G. Miselyuk for his valuable advice, and to Senior Engineer V. M. Vasylev'skiy for the direction of a series of structural investigations of samples of germanium with Te impurities." Orig. art. has: 3 figures and 4 formulas.

ASSOCIATION: Insty*tut napivprovidnykiv AN URSR, Kiev (Institute of Semiconductors AN URSR)

GLINCHUK, K.D. [Hlynchuk, K.D.]

States with negative temperat... containing impurities. Ukr. ... 0 '63.

1. Institut poluprovodnikov AN ...

GLINCHUK, K.D., LITOVCHENKO, N.M.

Activation of impurity centers in silicon. Fiz. tver. tela 6 no.12:3701-3702 D '64. (MIRA 18:2)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

GLINCHUK, K.D. [illegible]

[illegible]

[illegible]

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000515410003-2"

L 22547-65 EWT(m)/EWP(j) RM

ACCESSION NR: AP4043099 S/0185/64/009/007/0805/0807

AUTHORS: Gly*nchuk, K. D. (Glinchuk, K.D.); Deny*sova, A. D. (Denisova, A. D.); Ly*tovchenko, N. M. (Litovchenko, N. M.)

TITLE: The nature of centers of trapping and capture of current carriers in thermally treated silicon. II.

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 7, 1964, 805-807

TOPIC TAGS: trapping center, capture center, current carrier trapping center, current carrier capture center, silicon, iron additive, copper additive, nickel additive, zinc additive, palladium additive, energy state, silicon structural defect, annealing

ABSTRACT: The trapping of current carriers in silicon alloyed with admixtures of Fe, Cu, Ni, Zn or Pd atoms, which in certain charge stages tend to form complexes with themselves or with oxygen, was studied by comparing the energy state of centers produced by them, and the change in their concentration upon aging, with analgous values for control samples. The presence of the additives (Cu, Fe) caused an increase in the concentration of the electron and hole trapping centers; the concentration, the change in concentration

Card 1/2

L 22547-65

ACCESSION NR: AP4043099

with time, and the energy state of the capture centers approximated the concentrations and the energy state in the control thermally treated silicon. It was concluded that complexes of the admixed atoms, as well as structural defects, can be trapping and capture centers for current carriers in n- and p-type silicon. Annealing does not necessarily deactivate the complexes-- some of them, especially the complexes with oxygen, are stable at high temperatures. Orig. art. has: 3 figures

ASSOCIATION: Instytut napivprovidnykiv AN URSR, Kiev (Institute of Semiconductors, AN URSR)

SUBMITTED: 20Mar64 ENCL: 00

SUB CODE: SS, EE NR REF SOV: 003 OTHER: 003

Card 2/2

L 38090-65 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD

ACCESSION NR: AP5005912 S/0185/65/010/002/0172/0177

AUTHOR: Hlynchuk, K. D. (Glinchuk, K. D.); Lytovchenko, N. M. (Litovchenko, N.M.)

27

TITLE: Deactivation and activation of impurities in silicon

22

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 2, 1965, 172-177

B

TOPIC TAGS: silicon, doping, impurity solubility, impurity activation, impurity deactivation

ABSTRACT: The article deals with the influence of annealing at 800--1200C on the electrical behavior of Au, Zn, Pt, S, and Fe impurity atoms in silicon. The in-

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L 38090-65
ACCESSION NR: AP5005912

in the semiconductor on the temperature. The presence of such a dependence causes the impurities in the semiconductor to be in a metastable state at a tem- perature different from the temperature at which the impurities were introduced.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000515410003-2"

4 formulas.

ASSOCIATION: Instytut napivprovidnykiv AN URSR, Kiev (Institute of Semiconductors, AN UkrSSR)

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: SS

Card 2/3

L 14127-66
ACC NR: AP6000882

place. The measurements were made with partially compensated samples with high resistivity that increased exponentially with decreasing temperature. The photocurrent was found to be constant at low temperatures and to grow considerably at high temperatures. The shape of the spectral curves also was strongly temperature dependent. The results are attributed to the effect produced by the depth of the levels produced by the impurities and by the thermal excitation of the carriers from these levels. This produces effectively additional centers whose optical ionization contributes greatly to the photoconductivity at low temperatures. The authors also report that they observed in nSi + Zn extinction of photoconductivity, which is connected, as in germanium, with transitions to and from the deep levels. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 05Jul65/ ORIG REF: 003/ OTH REF: 001

TS

Card 2/2

GLINCHUK, K.D.; DENISOVA, A.D.; LITOVCHENKO, N.M.

[illegible] ...tivity of silicon doped with impurities forming deep [illegible]
Fiz. tver. tela 7 no. 12:3669-3670 D '65
(MIRA 19:1)

1. [illegible] poluprovodnikov AN UkrSSR, Kiyev.

L 25446-66 EWA(h)/EWT(1)/EWT(m)/T/EWP(t) IJP(c) AT/JD

ACC NR: AP6009699 SOURCE CODE: UR/0181/66/008/003/0969/0971

AUTHORS: Glinchuk, K. D.; Litovchenko, N. M.; Novikova, V. A.

ORG: Institute of Semiconductors, AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Carrier capture in plastically deformed silicon

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 969-971

TOPIC TAGS: silicon, plastic deformation, carrier density, carrier lifetime, electron capture, photoconductivity, crystal dislocation phenomenon

ABSTRACT: The authors measured the effects of plastic deformation of n- and p-silicon at 850 -- 950C and found that it caused practically no change in the density of the equilibrium carriers. The lifetimes of the electrons and of the holes were determined by measuring the stationary intrinsic photoconductivity and the photomagnetic emf. A comparison of data for the plastically deformed and control samples shows that deformation produces in both p- and n-silicon capture

Card 1/2

L 25446-66
ACC NR: AP6009699

centers with strongly differing cross sections for the capture of electrons and holes, so that the photoconductivity lifetime in the deformed samples is different from that in the undeformed samples, and the bipolarity of the photoconductivity is thus violated. At $T \lesssim 300K$ the deformed silicon exhibits long-time components of photoconductivity relaxation. If it is assumed that the observed changes in the lifetime for photoconductivity are connected with capture of the carriers by the negatively charged dislocations, then the increase in the lifetime of the photoconductivity with decreasing temperature in n silicon is connected with a decrease in the probability of overcoming the repulsion barrier by the electron. It is shown that the assumption that the change in the lifetime is connected with carriers by negatively charged dislocations contradicts the experimental data, and it is concluded that deformation produces also positively charged defects, either pointlike or extended, which cause the violation of the bipolarity of the photoconductivity in p-type silicon. It is indicated that similar results were observed in germanium. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 04Oct65/ ORIG REF: 003/ OTH REF: 003

Card 2/2

L 06447-67 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) JD/AT
ACC NR: AP6026726 SOURCE CODE: UR/0181/66/008/008/2510/2511

43
B

AUTHOR: Glinchuk, K. D.; Litovchenko, N. M.

ORG: Institute of Semiconductors, AN UkrSSR, Kiev (Institut poluprovodnikov, AN UkrSSR)

TITLE: Quenching of photoconductivity in silicon

SOURCE: Fizika tverdogo tela, v. 8, no. 8, 1966, 2510-2511

TOPIC TAGS: photoconductivity, [illegible], silicon property

ABSTRACT: Quenching of photoconductivity (decrease in intrinsic photoconductivity due to irradiation with extrinsic light) was [illegible] in silicon. [illegible] conducted at [illegible] [illegible]. [illegible] with intrinsic light [illegible] photoconductivity [illegible]). Turning [illegible] [illegible], i. e., [illegible] the [illegible] of [illegible]. [illegible] with [illegible] intrinsic light, [illegible] the [illegible] sic light is [illegible] turning on of the light leads to [illegible] current [illegible] [illegible] light is [illegible] [illegible] zinc atoms, is presented. The [illegible]

Card 1/2

ACC NR: AP6025725

and rate of formation of fast recombination centers. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 11Mar66/ ORIG REF: 001/ OTH REF: 002

Card 2/2

L 09351-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD
ACC NR: AP6031315 SOURCE CODE: UR/0185/66/011/007/0745/0751

AUTHOR: Hlynchuk, K. D. -Glinchuk, K. D.; Denysova, A. D. - Denisova, A. D.; Lytovchenko, N. M. - Litovchenko, N. M.; Vorobkalo, F. M.

ORG: Institute of Semiconductors AN UkrSSR, Kiev (Instytut napivprovidnykiv AN URSR)

TITLE: Change in the electric and photoelectric properties of silicon by heat treatment

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 7, 1966, 745-751

TOPIC TAGS: silicon semiconductors, Hall effect, photoconductivity, relaxation process, semiconductor carrier, electron recombination, photon emission, impurity center

ABSTRACT: The authors heated single-crystal silicon in evacuated quartz ampoules and measured the Hall effect, the stationary intrinsic photoconductivity, and the photomagnetic emf. The impurity photoconductivity studied with a spectrometer and recorded with a synchronous detector. The photoconductivity relaxation kinetics was investigated by applying light pulses. The concentration of the equilibrium carriers (electrons and holes) were determined from the Hall effect. The production of adhesion and capture centers was effected by heating to various high temperatures. The results show that heat treatment of n-Si at 1050C and of p-Si at T > 750C leads to

L 09351-67

ACC NR: AP6031315

formation of centers which greatly influence the concentration of the equilibrium carriers and the intrinsic and impurity photoconductivities. Recombination of the carriers through some of the centers can occur, accompanied by photon emission. These centers are connected with diffusion of the impurities from the surface and the formation of impurity complexes, or else with structure defects. Annealing at temperatures close to 500C deactivates the thermally induced adhesion and capture centers. Orig. art. has: 7 figures.

SUB CODE: 20/ SUBM DATE: 23Aug65/ ORIG REF: 004/

ACC NR: AP7003611 SOURCE CODE: UR/0185/66/011/012/1324/1331

AUTHOR: Hlynchuk, K. D.—Glinchuk, K. D.; Denysova, A. D.—Denisova, A. D.; Lytovchenko, N. M.—Litovchenko, N. M.

ORG: Institute of Semiconductors, AN URSR, Kiev (Instytut napivprovidnykiv AN URSR)

TITLE: Photoconductivity of silicon doped with Au and Zn

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 12, 1966, 1324-1331

TOPIC TAGS: photoconductivity, photoconductor, silicon

ABSTRACT: The intrinsic and impurity photoconductivity of p- and n-type silicon doped with Av and Zn was investigated in the 90—300°K temperature range. The impurities were introduced by the diffusion method at 1200°C; impurity concentration was in the 10^{16}--10^{17} range. The photoconductivity spectrum at low temperatures (T - 90°K) depended on the introduced impurities, but at high temperatures (300°K), thermal centers formed during high-temperature annealing determine photoconductivity. In compensated n-Si + Zn, quenching of intrinsic photoconductivity was observed. This quenching is connected with exchange of the Zn atom charge under light action. Orig. art. has: 3 figures and 1 formula. [JP]

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: ~~005~~ 004/ OTH REF: ~~005~~ 006

Card 1/1 UDC: none

Vol 28, Nr 9.

... crystal. This method of investigation ...

atoms

estimating teneness

derived

2

S/170/60/003/008/009/014
B019/B054

AUTHORS: Glinchuk, M. D., Kalinovich, D. F., Kovenskiy, I. I., Smolin, M. D.

TITLE: A Method of Determining Diffusion Coefficients in Solids

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 8, pp. 78 - 81

TEXT: The authors investigate diffusion along an infinitely long cylinder with the radius R. It is assumed that at the beginning the diffusing substance is distributed at one end of the cylinder in a thickness ΔR and a width of 2l. The authors proceed from the diffusion equation (1) and obtain the approximate equation (4) for the distribution of concentration along the cylinder. Equation (5) indicates the concentration distribution of the diffusing substance after diffusion at the temperatures T_1 and T_2 for the durations t_1 and t_2, and the diffusion coefficients D_1 and D_2 are calculated from (4) and (5). Formula (7) gives the quantity of the substance diffused. By the method suggested here, the

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A Method of Determining Diffusion Coefficients in Solids S/170/60/003/006/009/014
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authors determined the diffusion coefficient of chromium in nickel. Table 1 gives the mean values of the diffusion coefficients for various temperatures. The diffusion coefficients were calculated by formula (9). Fig. 2 graphically shows the diffusion coefficient of chromium in nickel as a temperature function. The method suggested allows the determination of diffusion coefficients for various temperatures on a sample. The accuracy is designated to be satisfactory. There are 2 figures, 1 table, and 2 Soviet references.

ASSOCIATION: Institut metallokeramiki i spetssplavov AN USSR, g. Kiyev (Institute of Powder Metallurgy and Special Alloys of the AS UkrSSR, Kiev)

SUBMITTED: March 8, 1959

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S/181/62/004/009/026/045
B104/B186

AUTHORS: Glinchuk, M. D., and Deygen, M. F.

TITLE: ... properties of the electron-nuclear resonance of local ... centers near the surface of a non-metallic crystal

PERIODICAL: Fizika tverdogo tela, v. 4, no. 9, 1962, 2521-2529

TEXT: The paper deals with the frequency spectrum of the ... nuclear resonance of electrons. The spin Hamiltonian of a system of k nuclei interacting with an external static magnetic field $\vec{H}$ and a localized electron has the form

$$\mathcal{H}_t = -\frac{\mu_k}{I_k}(\mathbf{H}\hat{\mathbf{I}}_k) + a_k(\hat{\mathbf{I}}_k\hat{\mathbf{S}}) + \sum_{p,q} D_{kpq} I_{kp} \hat{S}_q \qquad (1),$$

where μ_k is the nuclear magnetic moment, I_k is the amount of the nuclear spin, $\vec{I}_k$ is the nuclear spin vector, $\hat{S}$ is the electron spin operator, a_k is the Fermi constant of the hyperfine interaction, and D_{kpq} is the

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[illegible] In addition to the Fermi [illegible] independent parameters. This [illegible] symmetry properties of the problem. [illegible] Eq. (1) has the form

$$\mathcal{H}_I = -\frac{\mu_k}{I_k}(H\hat{I}_k) + a_k(\hat{I}_k\hat{S}) + D_{k1}[(\hat{I}_k\hat{S}) - 3\hat{I}_{k3}\hat{S}_3]. \qquad (3).$$

[illegible] The Hamiltonian of [illegible]

$$\hat{\mathcal{H}}_I = -\frac{\mu_k}{I_k}(\mathbf{H}\hat{\mathbf{I}}_k) + a_k(\hat{\mathbf{I}}_k\hat{\mathbf{S}}) + b_{k1}[(\hat{\mathbf{I}}_k\hat{\mathbf{S}}) - 3\hat{I}_{k1}\hat{S}_1] + b_{k2}[(\hat{\mathbf{I}}_k\hat{\mathbf{S}}) - 3\hat{I}_{k2}\hat{S}_2], \qquad (4)$$

$$b_{k1} = -\frac{1}{3}(2D_{k1} + D_{k2}); \quad b_{k2} = -\frac{1}{3}(D_{k1} + 2D_{k2}). \qquad (4a),$$

contains three independent parameters, and that of groups C_2 and S_2 contains four. The electron nuclear resonance frequencies can be written as

$$h\nu_k = \left| M_s \left[\sum_{p=1}^{3} \Delta^2_{kp} \right]^{1/2} \right|, \qquad (5),$$

where M_s is the quantum number of projections of the electron spin onto the field. Thus, the Hamiltonian (3) is given by

$$\left[\sum_{p=1}^{3} \Delta^2_{kp} \right]^{1/2} = \left(-\frac{\mu_k H}{I_k M_s} + a_k + D_{k1} \right) \left[1 - 6\varepsilon_k \left(1 - \frac{3}{2}\varepsilon_k \right) (\tau_{3k} H_0)^2 \right]^{1/2},$$

$$\varepsilon_k = \frac{D_{k1}}{-\frac{\mu_k H}{I_k M_s} + a_k + D_{k1}}, \qquad (6),$$

and the Hamiltonian (4) is given by

$$\left[\sum_{p=1}^{3} \Delta_{kp}^2\right]^{1/2} = \Big\{\Big[-\frac{\mu_k H}{I_k M_s} + c_k + b_{k1} + b_{k2}\Big]^2 - $$

$$-6\Big[-\frac{\mu_k H}{I_k M_s} + c_k + b_{k1} + b_{k2}\Big]\big[b_{k1}(\tau_{1k}\mathbf{H}_0)^2 + b_{k2}(\tau_{2k}\mathbf{H}_0)^2\big] + \qquad (7),$$

$$+9\big[b_{k1}^2(\tau_{1k}\mathbf{H}_0)^2 + b_{k2}^2(\tau_{2k}\mathbf{H}_0)^2\big]\Big\}^{1/2}.$$

where τ [illegible] the [illegible] along the principal axis, and $\vec{H}_0$ is that along the magnetic field $\vec{H}_0$. It may be seen that the angular dependence of the frequencies is determined by $(\tau,\vec{H}_0)$ in the case of (6), and by $(\tau,\vec{H}_0)$, $(\tau,\vec{H}_0)$ in the case of (7). The possible number of lines depends on the nature of the defect, the type of lattice, and on how the electron is localized. In an alkaline halide crystal, the electron has a small radius of state and the coupling constants quickly decrease with increasing

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S/181/62/004/009/025/045
Some properties of the electron-nuclear ... B104/B106

[illegible] the defect. It is sufficient to allow for the hyperfine interaction with localized electron centers in the immediate neighborhood. In crystals with electrons having large radii of state it is necessary that the interaction with the coordination spheres at larger distances be taken into account. The results are illustrated by an analysis of the spectrum for the first and second coordination spheres of F-centers in the NaCl-type lattice and of the spectrum of a paramagnetic defect for atoms of the first coordination sphere in the diamond-type lattice. It is shown that the frequency depends on the orientation of the crystal in the magnetic field, and that the particularities of the spectrum and of the angular dependence of the frequencies make it possible to separate the surface states from the body states. There are 1 figure and 6 tables.

ASSOCIATION: Institut poluprovodnikov AN USSR, Kiyev
(Institute of Semiconductors AS UkrSSR, Kiyev)

SUBMITTED: May 7, 1962

Card 2/2

GLINCHUK, M.D.; DEYGEN, M.F.

On the theory concerning local electron centers near the surface of a semiconductor. Fiz. tver. tela 5 no.2:405-416 F '63. (MIRA 16:5)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.
(Semiconductors—Electric properties) (Wave mechanics)

DEYGEN, M.F.; GLINCHUK, M.D.

Excitons near the surface of a homopolar crystal. Fiz. tver. tela 5 no.11:3250-3258 N '63. (MIRA 16:12)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

GLINCHUK, M.D. [Hlynchuk, M.D.]

Theory of local electron centers near the surface of a semiconductor film. Ukr. fiz. zhur. 8 no.7:[illegible] Jl '63. (MIRA 16:8)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR, Kiyev.

(Electrons)

DEYGEN, M.F. [Deihen, M.F.]; GLINCHUK, M.D. [Hlynchuk, M.D.]

Optical properties of local electron centers near the surface of a semiconductor. Ukr. fiz. zhur. 8 no.10:1075-1084 O '63. (MIRA 17:1)

1. Institut poluprovodnikov AN UkrSSR i Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR, Kiyev.

ACC NR: AP[illegible] (A, N) SOURCE CODE: UR/0181/66/008/011/3354/3362

AUTHOR: Glinchuk, M. D.; Grachev, V. G.; Deygen, M. F.

ORG: Institute of Semiconductors AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Spin-lattice relaxation of exchange-interacting impurity centers

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3354-3362

TOPIC TAGS: spin lattice relaxation, impurity center, cubic crystal, hyperfine structure, color center, crystal symmetry, electron spin

ABSTRACT: The authors consider the spin-lattice relaxation of pairs of impurity centers (the isolated center has an electron spin 1/2) in crystals of cubic syngony, and show that for such systems, allowance for exchange interaction can noticeably change the relaxation time and its dependence on the magnetic field. An expression is derived for the time of spin-lattice relaxation of the impurity centers with allowance for the hyperfine and exchange interactions. The dependence of the relaxation time on the magnetic field is obtained and on the value of the exchange interaction. The reason for the decrease of the relaxation time with increasing exchange is explained. The results of the theory are compared with experimental data on the relaxation of clusters of F-centers in KCl and of phosphorus atoms in silicon. In both cases the theory agrees with experiment. It is shown that the temperature dependence of the relaxation time of clusters is the same as that for isolated centers. The value of exchange interaction is estimated for the spin-lattice relaxation of the F-centers.

ACC NR: AP6036984

The procedure employed for the calculations can be used also for crystal fields with different symmetry and for different values of the electron spin. Orig. art. has: 2 figures and 32 formulas.

SUB CODE: 20/ SUBM DATE: 03Mar66/ - ORIG REF: 004/ OTH REF: 005

Card 2/2

GLINDZICH, V.A.

Measuring thicknesses by sections with various vertical and horizontal scales. Biul. nauch.-tekh. inform. VIMS no.2:9-10 '63. (MIRA 18:2)

1. Vsesoyuznyy aerogeologicheskiy trest Ministerstva geologii i okhrany nedr SSSR.

GLINDZICH, Ye.V. [translator].

Electric heating of tank furnaces (from "Bull. Amer. Ceram. Soc." no.1 1957). Stek. i ker. 14 no.12:23-27 D '57. (MIRA 11:1)
(United States--Glass furnaces)

GLINE, T.I.; SEFEROVA, N.I.

Sarcomatous degeneration of one of the foci of multiple chondromatosis. Ortop., travm.i protez. 21 no.1:74-76 Ja '60. (MIRA 13:12)

(CARTILAGE—TUMORS)

GLINENKO

SOV/112-58-1-1422

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1958, Nr 1, p 210 (USSR)

AUTHOR: Glinenko, K. S.

TITLE: On the Design of Amplifier Circuits With Multielectrode Tubes
(K raschetu usilitel'nykh skhem na mnogoelektrodnykh lampakh)

PERIODICAL: Nauch. zap. L'vovsk. politekhn. in-ta, 1955, Nr 27, pp 71-76

ABSTRACT: Bibliographic entry.

AVAILABLE: Library of Congress

1. Amplifiers--Circuits 2. Electric circuits--Design 3. Electron tubes--Applications

Card 1/1

GLINENYY, Ya.; AVERIN, V.V.; SAMARIN, A.M.

[illegible]

The influence of oxidizable elements on the solubility of O_2 in 18-8 type stainless steels.

report submitted for the 5th Physical Chemical Conference on Steel Production.

[illegible] 30 [illegible]